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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/525,058

09/06/2005

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21928-017US1

5861

26161 7590 04/13/2009
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EXAMINER

MOWLA, GOLAM

ART UNIT

PAPER NUMBER

1795

NOTIFICATION DATE

DELIVERY MODE

04/13/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary	Application No. 10/525,058	Applicant(s) BRABEC ET AL.	
	Examiner GOLAM MOWLA	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-17 and 20-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-17 and 20-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/29/2009 has been entered.

Response to Amendment

2. Applicant's amendment of 01/29/2008 does not place the Application in condition for allowance.

3. Claims 1-4, 6-17 and 20-49 are pending. Applicant has amended claims 1, 3, 4, 7, 10, 16, 21, 23, 28, 31, 32, 36 and 38-40, cancelled claims 5, 18 and 19, and added new claims 42-49.

Status of the Objections or Rejections

4. Due to Applicant's amendment of claims 1, 3, 4, 7, 10, 16, 21, 23, 28, 31, 32, 36 and 38-40., all rejections from the office Action mailed on 01/23/2009 are withdrawn. However, upon further consideration, a new ground is presented below.

Response to Arguments

5. Applicant's arguments with respect to claims 1-4, 6-17 and 20-49 have been considered but are moot in view of the new ground(s) of rejection as necessitated by the amendment.

Applicant argues that the claims as amended is not anticipated or obvious over the prior art of record. This is persuasive and is moot in view of the new ground of rejection as necessitated due to Applicant's amendment to claims 1, 3, 4, 7, 10, 16, 21, 23, 28, 31, 32, 36 and 38-40.

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1, 3-4, 6-7, 9, 10, 12-15, 21, 23-28, 30-43 and 45-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuno (US 6350945) in view of Shaheen et al. (WO/2001/084644, refer to US 2003/0159729 A1 for translation).

Regarding claim 1, Mizuno discloses a photovoltaic component (see col. 1, lines 12-16, col. 3, line 50 to col. 4, line 44; see also fig. 2), comprising:

- a substrate (15) having a first surface (top surface touching layer 16) and a second surface (bottom surface touching layer 14) opposite the first surface (top surface), the first surface (top surface) of the substrate (15) being a structured surface (see fig. 2),
- a photovoltaic component (solar cell 10; fig. 2) having a first and second electrodes and a semiconductor layer (inherent features of a solar cell).

Although Mizuno discloses that the photovoltaic component (10) can be organic photovoltaic component (see col. 1, lines 12-16), the reference does not explicitly disclose the use of an organic photovoltaic component comprising an organic semiconductor layer having a conjugated polymer and an acceptor.

Shaheen discloses an organic photovoltaic component (fig. 1) ([0010-0014])) comprising of a first electrode (electrode 6) that has a planar surface (fig. 1), an organic semiconductor layer (photoactive layer 4) having a conjugated polymer and an acceptor ([0011]), and a second electrode (electrode layer 2), the organic semiconductor layer (4) being between the first electrode (6) and second electrode (2) allows for a device with improved short-circuit current ([0003] and [0005]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the organic photovoltaic component of Shaheen in place of solar cell of Mizuno to allow for increased short-circuit current, as shown by Shaheen.

Regarding claim 3, Mizuno in view of Shaheen further discloses an additional layer (16) between the substrate (15) and the first electrode (electrode 3 of Shaheen), the additional layer (16) having a surface (lower surface) that is structured.

Regarding claim 4, Mizuno discloses a method comprising:

- providing a photovoltaic component (solar cell 10; see col. 1, lines 12-16, col. 3, line 50 to col. 4, line 44; see also fig. 2), comprising:
 - a substrate (15) having a first surface (top surface touching layer 16) and a second surface (bottom surface touching layer 14) opposite the first surface (top surface), the first surface (top

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surface) of the substrate (15) being a structured surface (see fig. 2),
and

- a photovoltaic component (solar cell 10; fig. 2) having a first and second electrodes and a semiconductor layer (inherent features of a solar cell).

Although Mizuno discloses that the photovoltaic component (10) can be organic photovoltaic component (see col. 1, lines 12-16), the reference does not explicitly disclose the use of an organic photovoltaic component comprising an organic semiconductor layer having a conjugated polymer and an acceptor.

Shaheen discloses an organic photovoltaic component (fig. 1) ([0010-0014])) comprising of a first electrode (electrode 6) that has a planar surface (fig. 1), an organic semiconductor layer (photoactive layer 4) having a conjugated polymer and an acceptor ([0011]), and a second electrode (electrode layer 2), the organic semiconductor layer (4) being between the first electrode (6) and second electrode (2) allows for a device with improved short-circuit current ([0003] and [0005]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the organic photovoltaic component of Shaheen in place of solar cell of Mizuno to allow for increased short-circuit current, as shown by Shaheen.

Regarding claim 6, Mizuno in view of Shaheen further discloses an additional layer (16) on the structured surface (top surface) of the substrate (15) so that the additional layer (16) has a structured surface (lower surface) that supports the semiconductor layer (layer 5 of Shaheen).

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Regarding claim 7, Mizuno discloses a photovoltaic component (see col. 1, lines 12-16, col. 3, line 50 to col. 4, line 44; see also fig. 2), comprising:

- a substrate (15) having a first surface (top surface touching layer 16) and a second surface (bottom surface touching layer 14) opposite the first surface (top surface), the first surface (top surface) of the substrate (15) being a structured surface (see fig. 2), and
- a photovoltaic component (solar cell 10; fig. 2) having a first and second electrodes and a semiconductor layer (inherent features of a solar cell).

Although Mizuno discloses that the photovoltaic component (10) can be organic photovoltaic component (see col. 1, lines 12-16), the reference does not explicitly disclose the use of an organic photovoltaic component comprising an organic semiconductor layer.

Shaheen discloses an organic photovoltaic component (fig. 1) ([0010-0014])) comprising of a first electrode (electrode 6) that has a planar surface (fig. 1), an organic semiconductor layer (photoactive layer 4) having a conjugated polymer and an acceptor ([0011]), and a second electrode (electrode layer 2), the organic semiconductor layer (4) being between the first electrode (6) and second electrode (2) allows for a device with improved short-circuit current ([0003] and [0005]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the organic photovoltaic component of Shaheen in place of solar cell of Mizuno to allow for increased short-circuit current, as shown by Shaheen.

Regarding claim 9, Mizuno in view of Shaheen further discloses that a surface of the semiconductor is planar (see fig. 1 of Shaheen).

Regarding claim 10, Mizuno in view of Shaheen further discloses that the first electrode (electrode 6 of Shaheen) is disposed on the first surface (top surface) of the substrate (15 of Mizuno).

Regarding claim 12, Mizuno in view of Shaheen further discloses a planarized layer (17) between the substrate (15) and the first electrode (electrode 3 of Shaheen).

Regarding claim 13, Mizuno in view of Shaheen further discloses the first electrode (electrode 6 of Shaheen) is disposed on a planarized surface (top surface) of the planarized layer (17) (see fig. 1 of Shaheen).

Regarding claim 14, Mizuno in view of Shaheen further discloses a planarized layer (barrier layer 8, ¶ 0069; see fig. 7 that shows the barrier layer is planarized) between the organic semiconductor (layer 4 of Shaheen) and the first electrode (layer 6 of Shaheen).

Regarding claim 15, Mizuno in view of Shaheen further discloses that the first electrode (layer 6 of Shaheen) is disposed on the substrate (15).

Regarding claim 21, Mizuno in view of Shaheen further discloses that the acceptor comprises a fullerene ([0011] of Shaheen).

Regarding claim 23, Mizuno discloses a photovoltaic component (see col. 1, lines 12-16, col. 3, line 50 to col. 4, line 44; see also fig. 2), comprising:

- a substrate (15) having a surface (top or bottom surface);

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- a support layer (16) having a surface (top or bottom surface) (see fig. 2) and
- a first electrode (solar cell 10 inherently has two electrodes - anode and cathode; in this case the first electrode would be the one touching layer 17), the support layer (16) being between the substrate (15) and the first electrode;
- a second electrode (solar cell 10 inherently has two electrodes - anode and cathode; in this case the second electrode would be the opposite the first electrode which touches layer 17);
- a semiconductor layer between the first and second electrodes ((solar cell 10 has a semiconductor layer between anode and cathode),
- wherein:
 - the first electrode is between the support layer (16) and the semiconductor; and
 - at least one surface selected from the group consisting of the surface of the substrate (15) and the surface of the support layer is structured (see fig. 2 which shows top surface of substrate 15 is structured, and bottom surface of support layer 16 is structured).

Although Mizuno discloses that the photovoltaic component (10) can be organic photovoltaic component (see col. 1, lines 12-16), the reference does not explicitly disclose the use of an organic photovoltaic component comprising an organic semiconductor layer with a planar surface having conjugated polymer and an acceptor.

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Shaheen discloses an organic photovoltaic component (fig. 1) ([0010-0014])) comprising of a first electrode (electrode 6) that has a planar surface (fig. 1), an organic semiconductor layer (photoactive layer 4) with a planar surface (fig. 1) having a conjugated polymer and an acceptor ([0011]), and a second electrode (electrode layer 2), the organic semiconductor layer (4) being between the first electrode (6) and second electrode (2) allows for a device with improved short-circuit current ([0003] and [0005]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the organic photovoltaic component of Shaheen in place of solar cell of Mizuno to allow for increased short-circuit current, as shown by Shaheen.

Regarding claim 24, Mizuno further discloses that the surface (bottom surface) of the support layer (16) is structured (see fig. 2).

Regarding claim 25, Mizuno further discloses that the surface (top surface) of the substrate (15) is structured.

Regarding claim 26, Mizuno further discloses that the surface (bottom surface) of the substrate (15) is planar.

Regarding claim 27, Mizuno further discloses that the surface (top surface) of the support layer (16) is planar.

Regarding claim 28, Mizuno further discloses that the first surface (top surface) of the substrate (15) has a periodic structure (see fig. 2 and 10).

Regarding claim 30, Mizuno in view of Shaheen further discloses an additional layer (16) between the substrate (15) and the first electrode (electrode 3 of Shaheen), the additional layer (16) having a surface (bottom surface) that is structured.

Regarding claims 31-33, Mizuno further discloses that the first/structured surface (top surface) of the substrate (15) has a periodic structure (see fig. 2 and 10).

Regarding claim 34, Mizuno further discloses that the periodic structure (structure of top surface of 15) of the substrate (15) is configured to impart light trapping during use of the organic photovoltaic component (see fig. 10). Examiner also notes that the functional limitation “to impart light trapping during use of the organic photovoltaic component” does not add any structural limitation to the product, and therefore has not been given any patentable weight.

Regarding claim 35, Mizuno further discloses that the structured surface (bottom surface) of the support layer (16) has a periodic structure (see fig. 2 and 10).

Regarding claims 36 and 40, Mizuno discloses a photovoltaic component (see col. 1, lines 12-16, col. 3, line 50 to col. 4, line 44; see also fig. 2), comprising:

- a substrate (15) having a surface with a periodic structure (see fig. 2 and 10) and
- a photovoltaic component (solar cell 10; fig. 2) having a first and second electrodes and a semiconductor layer (inherent features of a solar cell).

Although Mizuno discloses that the photovoltaic component (10) can be organic photovoltaic component (see col. 1, lines 12-16), the reference does not explicitly disclose the use of an organic photovoltaic component comprising an organic semiconductor layer with a planar surface having conjugated polymer and an acceptor.

Shaheen discloses an organic photovoltaic component (fig. 1) ([0010-0014])) comprising of a first electrode (electrode 6) that has a planar surface (fig. 1), an organic

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semiconductor layer (photoactive layer 4) with a planar surface (fig. 1) having a conjugated polymer and an acceptor ([0011]), and a second electrode (electrode layer 2), the organic semiconductor layer (4) being between the first electrode (6) and second electrode (2) allows for a device with improved short-circuit current ([0003] and [0005]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the organic photovoltaic component of Shaheen in place of solar cell of Mizuno to allow for increased short-circuit current, as shown by Shaheen.

Regarding claims 37 and 41, Mizuno further discloses that the periodic structure of the substrate (15) is configured to impart light trapping during use of the organic photovoltaic component (see fig. 10). Examiner also notes that the functional limitation “to impart light trapping during use of the organic photovoltaic component” does not add any structural limitation to the product, and therefore has not been given any patentable weight.

Regarding claim 38, Mizuno discloses a method comprising:

- providing a photovoltaic component (solar cell 10; see col. 1, lines 12-16, col. 3, line 50 to col. 4, line 44; see also fig. 2), comprising:
 - a substrate (15) having a surface (top surface) that is periodically structured (see fig. 2) and
 - a photovoltaic component (solar cell 10; fig. 2) having a first and second electrodes and a semiconductor layer (inherent features of a solar cell).

Although Mizuno discloses that the photovoltaic component (10) can be organic photovoltaic component (see col. 1, lines 12-16), the reference does not explicitly disclose the use of an organic photovoltaic component comprising an organic semiconductor layer with a planar surface having conjugated polymer and an acceptor.

Shaheen discloses an organic photovoltaic component (fig. 1) ([0010-0014])) comprising of a first electrode (electrode 6) that has a planar surface (fig. 1), an organic semiconductor layer (photoactive layer 4) with a planar surface (fig. 1) having a conjugated polymer and an acceptor ([0011]), and a second electrode (electrode layer 2), the organic semiconductor layer (4) being between the first electrode (6) and second electrode (2) allows for a device with improved short-circuit current ([0003] and [0005]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the organic photovoltaic component of Shaheen in place of solar cell of Mizuno to allow for increased short-circuit current, as shown by Shaheen.

Regarding claim 39, Mizuno further discloses that the structure of the substrate (15) is configured to impart light trapping during use of the organic photovoltaic component (see fig. 10). Examiner also notes that the functional limitation “to impart light trapping during use of the organic photovoltaic component” does not add any structural limitation to the product, and therefore has not been given any patentable weight.

Regarding claims 42, 43 and 45-49, Mizuno in view of Shaheen further discloses that the organic semiconductor layer (layer 4 of Shaheen) comprises a conjugated polymer and a fullerene acceptor ([0011] of Shaheen).

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8. Claims 16, 17, 20 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinohara et al. (US 5891264) in view of Shaheen.

Regarding claims 16, 17 and 20, Shinohara discloses a photovoltaic cell (fig. 9) (col. 10, line 55 to col. 11, line 9), comprising:

- a flexible substrate (201) that is not structured (see fig. 9);
- a first electrode (Ag layer 204);
- a first layer (Diffusion blocking layer 203), the first layer (203) being between the substrate (201) and the first electrode (204);
- a second layer (Al film 202), the second layer being between the substrate and the first electrode;
- a second electrode (transparent electrode 207); and
- a semiconductor (photoelectric conversion layer 206) between the first (204) and second (207) electrodes,
 - wherein the first electrode (204) is structured (see fig. 9), a surface (top or bottom) of the first layer (203) is structured, a surface (bottom) of the second layer (202) is planar, and a surface of the semiconductor (top surface of layer 206) is planar (see fig. 9).

However, Shinohara is silent as to whether the semiconductor layer is an organic semiconductor layer comprising a conjugated polymer and an acceptor.

Shaheen discloses an organic photovoltaic component (fig. 1) ([0010-0014])) wherein the semiconductor comprising an organic semiconductor layer (photoactive

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layer 4) with a planar surface (fig. 1) having a conjugated polymer and an acceptor ([0011]) allows for a device with improved short-circuit current ([0003] and [0005]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the organic semiconductor of Shaheen in the photovoltaic cell of Shinohara to allow for increased short-circuit current, as shown by Shaheen.

Regarding claim 44, Shinohara in view of Shaheen further discloses that the organic semiconductor layer (layer 4 of Shaheen) comprises a conjugated polymer and a fullerene acceptor ([0011] of Shaheen).

9. Claims 1, 4, 7, 11 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kambe et al. (US 5986206) in view of Bloch et al. (US 4683160).

Regarding claims 1, 7 and 11, Kambe discloses a photovoltaic cell (100) (fig. 1, col. 3, lines 18-50), comprising:

- a substrate (substrate support in contact with electrode 110) having a first surface (top surface which contacts electrode 110) and a second (bottom surface) surface opposite the first surface (top surface);
- a first electrode (electrode 110) with a planar surface (top surface) (see fig. 1), the first electrode (110) being a cathode (col. 6, lines 15-27), the first electrode (110) being closer to the first surface (top surface) of the substrate than the second surface (bottom surface) of the substrate (substrate support),
- an organic semiconductor layer comprising a conjugated polymer and an acceptor (donor/acceptor composite) (col. 5, lines 2-35), the first electrode

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being between the substrate (substrate support) and the organic semiconductor layer (102+104), and,

- a second electrode (electrode 112), the organic semiconductor (102+104) between the first (110) and second (112) electrodes.

However, Shinohara is silent as to whether the first surface of the substrate is structured.

Bloch teaches a solar cell with correlated roughness substrate (4) to increase the light absorption within the film of the incident light.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the structured substrate of Bloch in the photovoltaic component of Kambe to increase the light absorption within the film of the incident light, as taught by Bloch.

Regarding claim 4, Kambe discloses a method comprising an organic photovoltaic component (solar cell 100) (fig. 1, col. 3, lines 18-50), comprising:

- a substrate (substrate support in contact with electrode 110) having a first surface (top surface which contacts electrode 110) and a second (bottom surface) surface opposite the first surface (top surface);
- a first electrode (electrode 110) with a planar surface (top surface) (see fig. 1), the first electrode (110) being closer to the first surface (top surface) of the substrate than the second surface (bottom surface) of the substrate (substrate support),

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- an organic semiconductor layer comprising a conjugated polymer and an acceptor (donor/acceptor composite) (col. 5, lines 2-35), the first electrode being between the substrate (substrate support) and the organic semiconductor layer (102+104), and,
- a second electrode (electrode 112), the organic semiconductor (102+104) between the first (110) and second (112) electrodes.

However, Shinohara is silent as to whether the first surface of the substrate is structured.

Bloch teaches a solar cell with correlated roughness substrate (4) to increase the light absorption within the film of the incident light.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the structured substrate of Bloch in the photovoltaic component of Kambe to increase the light absorption within the film of the incident light, as taught by Bloch.

Regarding claim 22, Kambe in view of Bloch further discloses that the first electrode (110) has a structured surface (bottom surface is structured).

10. Claims 2, 8 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kambe in view of Bloch as applied to claims 1, 7 and 4 above, and further in view of Nakamura (US 6291763).

Regarding claims 2, 8 and 29, Applicant is directed above for complete discussion of Kambe in view of Bloch with respect to claims 1, 7 and 4, respectively,

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which is incorporated herein. The references are silent as to whether the substrate is flexible.

Nakamura teaches an organic photovoltaic component (fig. 2B and col. 29, lines 49-54) wherein the substrate (13) is made of flexible sheet (col. 31, lines 41-45) to allow for highly productive production process (col. 31, lines 41-45).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the flexible substrate of Nakamura in the organic photovoltaic component of Kambe in view of Bloch to allow for highly productive production process, as shown by Nakamura.

Correspondence/Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GOLAM MOWLA whose telephone number is (571) 270-5268. The examiner can normally be reached on M-F, 0900-1700 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ALEXA NECKEL can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/G. M./

Examiner, Art Unit 1795

/Alexa D. Neckel/

Supervisory Patent Examiner, Art Unit 1795